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Language and knowledge: how nouns contribute to knowledge construction across school subjects

Mary J. Schleppegrell

Abstract

Increase in migration around the world has put a focus on the role language plays in the construction of knowledge across school subjects, as attention to language can support diverse learners in subject area learning. Drawing on the notions of *register* and *grammatical metaphor* from systemic functional linguistics, this article shows how *nouns* are powerful resources for knowledge construction and presentation that vary in the ways they are drawn on in different disciplines for functional purposes. In addition, it shows how developmentally, children move from elaboration and expansion of the noun group toward abstraction and grammatical metaphor through nominalization. Examples from language arts, science, and history/social studies illustrate the roles nouns, noun groups, and nominalization play in constructing knowledge at different age levels and in different subject areas. Implications for pedagogy are drawn.

Keywords

Nouns, Systemic functional linguistics, Disciplinary differences

1 Language and knowledge

The great increase in migration in countries around the world in recent years has brought language into greater focus for educators across school subjects. Although language has always been a challenging aspect of learning across disciplines, the presence in classrooms at all levels and in all grade levels of students whose home language is different from the language of schooling has brought new focus to the linguistic challenges of learning. Having greater numbers of students who are learning concepts through a language other than their mother tongues calls for new ways of thinking about the role of language in learning, and new approaches to making knowledge available to a more diverse group of learners (e.g., Beacco et.al., 2015).

A focus on the knowledge to be developed is key in this endeavor, as learners typically have the cognitive capacity to engage with the grade level curriculum, if teachers are able to lessen the linguistic burden of reading complex texts and engaging in challenging writing and speaking tasks in a language students are still developing. In focusing on the knowledge students develop in schooling, attention to language and the role language plays in the construction of knowledge offers new ways of thinking about the kinds of supports students need for success across subject areas. This paper thus explores some ways knowledge is presented in different disciplines from a linguistic point of view, from the perspective that language development and knowledge development are not separate processes. Language and knowledge develop together across the lifespan, making the relationship between language and knowledge an important focus for teachers' understanding.

While language is more than *words,* the technicality of different school subjects makes disciplinary vocabulary highly salient in pedagogical contexts, so an exploration of the relationship between language and knowledge in different subject areas can arguably be fruitfully engaged with through a focus on the ways *nouns*, as "content words," act as resources for knowledge construction and presentation. Drawing on a theory of language that enables linguistic form to be related to meaning in contexts of use, this article explores the ways students in history/social studies, language arts, and science at different grade levels are expected to draw on nouns in different ways to construct and present knowledge.

2 A theory of language variation in social context

Systemic functional linguistics (SFL) (Halliday, 1978; 2014) is a functional theory of language in social interaction. Viewing language as social semiotic, a meaning-making system, offers us a perspective that recognizes the ways different social contexts, including the different epistemological contexts of subject area classrooms, naturally call on different meanings and forms of meaning making that are realized in different patterns of language. Language use is always socially and culturally situated, and the grammar and vocabulary of a language are resources for meaning, offering choices that enable us to achieve social purposes. Those choices are shaped by the contexts of language use, and our language choices then in turn further shape contexts as we interact in speech and writing. From an SFL perspective, grammar and vocabulary, or *lexicogrammar,* is a fundamental meaning-making resource; not as a set of rules for correctness, but as options to draw on. SFL theory offers the notion of linguistic *register* as a way of describing differences in the constellations of language choices that are associated with the different contexts in which we use language in social life.

Three aspects of the social context are seen as shaping speakers' and writers' language choices (and thus the *registers* they use) (e.g., Halliday & Hasan, 1985). These include the *field* of discourse, the 'content' that we speak and write about; the *tenor* of discourse, shaped by the different roles and stances we take up and project as speakers and writers; and the *mode* of discourse–whether it is spoken and written, language that accompanies action or language that constitutes social action, and how language relates to visual representations that accompany it. These context variables, *field*, *tenor*, and *mode*, influence the language choices we make as we construe experience, enact interpersonal relationships, and create or participate in an evolving text or discourse. In making language choices in realizing these different aspects of meaning in context, we engage with different *registers* (Halliday, 2014; Schleppegrell, 2004a). Exploring meaning in text from these three different angles helps us see how language varies in different tasks and contexts.

SFL also offers a theory of language *development* that helps us understand how texts become more challenging as students move through the school years, and helps us understand how language works to construct knowledge and values in different ways across subject areas (see, e.g*.,* Schleppegrell & Christie, 2018). Drawing on this theory,

this article asks the questions: *What can an analysis of nouns tell us about the development of knowledge across subject areas? How do changes in the ways nouns are typically used help us understand the new challenges students experience as they move through the years of schooling?*

3 Context and method of this study

The argument presented here comes from work in multiple educational research projects over the past 20 years. The goals of this program of research focused on identifying the linguistic challenges of school subjects and supporting teachers to learn about and draw students' attention to language in ways that would support subject matter learning. This meant focusing on the ways language works in different subjects and at different grade levels to construct the knowledge to be developed. All of these contexts involved some students learning English as an additional language. The studies included:

- Middle school students learning social studies and history with a focus on the ways language presents evidence in written sources that can be used to develop and present claims and reasoning. By supporting students to focus on nouns and associated language resources as they read, teachers engaged them with the knowledge to be developed (reported below).

- Secondary school history students learning to write arguments, whose teachers supported them through deconstruction of sentences and focus on the ways knowledge is presented in history texts (e.g., Schleppegrell & de Oliveira, 2006; Schleppegrell, 2006).

- Elementary school students, grades 2-5, learning to use functional grammar to explore the development of characters in the texts they read in language arts classes (e.g., Moore, Schleppegrell, & Palincsar, 2018)

- Middle school students engaged in an environmental education curriculum who wondered about the people doing these things and stimulated further inquiry into the ways agency is presented in language (Schleppegrell, 1997)

- University engineering students whose instructors wanted to learn more about how to support their writing about the experiments they were reporting (Schleppegrell, 2004b).

In each case, the instructional texts that were used as well as the students' written and oral language productions were analyzed to identify how the language choices supported knowledge development. For this article, data from these studies were revisited to draw attention to the important role of the noun and the development of the ways nouns are expected to be used to create texts in different subjects. Differences in register (*field, tenor, mode*) were analyzed and related to Halliday's theoretical perspective on the relationship between language and learning (e.g., Halliday, 1993a). For example, as students learn in a subject area classroom, the *field* of discourse may remain the same, but shifts in *tenor* and *mode* result in differences in the language students are expected to use.

As an illustration of this, compare these two moments in a year seven social studies classroom. The students are considering whether South Africa has made significant progress since the end of apartheid in 1992. They have read various sources related to the 20th anniversary of that event, including economic analyses. Eventually the students will undertake a writing task that involves reading the speeches of various candidates for the recent South African election and recommending which candidate should be endorsed. At this point in the sequence of activities across several days, students are discussing evidence from the sources that could support different claims and recommendations, reporting on evidence they have just underlined as they read. Lacie refers to one of the economic sources and reports:

> So I underlined *the average*, *on average the economy has grown at 3.2% a year from 1994 to 2012* [reading from the text]. That's like only around like 19 years, and to me it seems like that's not a lot, like a lot of growth. I feel like, just like to me, that doesn't really feel like a lot of growth, like enough has changed.

Lacie says that from her point of view, 3.2% growth per year is not good evidence that South Africa has made significant progress since 1994. She is speaking, so the grammar and vocabulary she uses are in a context of face-to-face interaction, emerging in structures that present the spontaneous qualities of the discussion context. These include the hesitations and infelicities of spoken language (note the many instances of the discourse marker *like,* for example). Lacie also presents this contribution to the discussion as her personal point of view (*to me it seems like…; I feel like, just like to me, that doesn't really feel like…*).

A few days later, the students write about which of the different candidates for president whose speeches they have analyzed (including one by Jacob Zuma), should be endorsed. At one point, Lacie again refers to the economic argument, but her language choices now construct a written text:

> Another reason Jacob Zuma should not be endorsed is because he lies about the rate of employed people. In his speech it says "…60% more people are employed now than in 1994." [quoting from the text] But in source #3, it says, "…official unemployment is about 25% and the real figure nearer 40%" [quoting from the text].

The *field* of this discourse is similar to the spoken language example, as both draw on and work with language and meanings from politics and economics. But now the *tenor* and *mode* have shifted, and Lacie's language choices are shaped by those shifts in context. In terms of tenor, the *I* of the spoken contribution is now absent, as are references to the positions taken as personal choices from her own point of view. Instead, the language is authoritative, putting forth reasons for her claim that Zuma not be endorsed, and supporting the claim with evidence from the texts she has read. A different stance is called for when interacting with others in discussion from the stance taken in making a recommendation in writing, and Lacie's language choices enable her to present these different stances; each functional for its context.

The *mode* of discourse has also shifted in the second example, which now shows features of the planning and constructedness of written discourse. While the spoken utterances present meanings in an emergent way, with evaluation infused throughout, the written text presents sentences that are packed with information. Lacie is in the process of developing new ways of using language, both in speech and writing, that enable her to present evidence and develop an argument for a claim. She is shifting her register choices in relation to the demands of the different contexts of language use, drawing on different language choices in response to the shifting context. Nouns are a key language resources for achieving these differences in register.

Nouns present many of the particular vocabulary choices that Lacie has made, and we readily recognize the ways the *field* of discourse relates to economics through words/meanings such as *the economy, growth, employed people, unemployment,* etc. But in addition, the shift in *mode*, from a spoken to a written 'text', has prompted Lacie to construct a text that draws on nouns in different ways; for example, creating the long complex noun groups *Another reason Jacob Zuma should not be endorsed* and *the rate of employed people*. These noun groups present abstractions that she has created to introduce a new piece of evidence and then set up a reference to the employment statistics she presents. This shows how nouns both index a text as relating to the particular subject matter, but also enable a writer to structure a text in ways that develop an argument.

We can see, then, that elaboration and expansion of noun groups plays a role in and indexes overall language development as children learn to write in more advanced and discipline-specific ways. In the next section I offer evidence from language arts, science, and history/social studies of the ways students' control of nouns and noun groups shows how they are building knowledge as they increasingly call upon more advanced and abstract language.

4 Early expansion of the noun group and development of abstraction in language arts

In their early writing, children typically tell about their experience and sometimes evaluate it, constructing simple clauses like these:

- My grandpa told me a story. I liked it.

As their writing develops, children learn to expand on their experience and evaluate it in new ways, drawing on new grammatical forms to express more elaborated meanings:

a. Grandpa told me a story about a man in a forest. It was really scary!
b. Grandpa told me a great story about a man in a forest who got lost and then saw a bear. I love it when he tells stories!

We see how the child builds up information in noun groups, expanding them with prepositional phrases (a story *about a man in a forest*) and embedded clauses (a man in a forest *who got lost and then saw a bear).* This expansion of the noun group enables the writer to elaborate and extend the information incorporated into a sentence. At the

same time, the writer's interpersonal evaluation presents her response to the story, expressing affect (*it was really scary, I love it…*).

As children grow in their capacity to represent information in written language, the language resources they draw on need to expand as they respond to more challenging contexts of writing than reporting their own experience. One way this happens in early literacy contexts is when students are asked to write about characters in a story, reporting on their experiences and evaluating them from the point of view of the reader.

In this example from year four (9-10 year old children), students are reading a story, *Tomás and the Library Lady* (Mora, 1997), about a boy who is a migrant farm worker, traveling across the U.S. with his family. Tomás is sent to the library by his grandfather, and in his interactions with the librarian, is introduced to many stories that he brings back to his family. The teacher asks students to write about the story, asking *How does Tomás become a story-teller? What people and events help him?*

In writing about Tomás, the students need to use the experience presented in the story to develop an analysis of the character, and this pushes them to restructure the language and meanings in the text they have read in order to present and evaluate Tomás's actions across the story. The story itself has an early event in which the family stops to rest under a tree, and the grandfather, Papa Grande, is asked to tell a story. The author writes:

> When they got hot, they sat under a tree with Papa Grande. "Tell us the story about the man in the forest," said Tomás. Tomás liked to listen to Papa Grande tell stories in Spanish. Papa Grande was the best storyteller in the family. (Mora 1997)

Writing analytically requires synthesizing information in the story into noun groups that can be put into relationship with each other to present characters and events and evaluate them. In response to this demand, a ten year old writes:

> One of the most important events in the story that show how Tomás felt and relates to him becoming a storyteller is Tomás with Papa Grande under a tree.

The writer begins with a very long noun group: *One of the most important events in the story that show how Tomás felt and relates to him becoming a storyteller*. This identifies the evaluative goal of the text being written: to identify important events, and the writer embeds a long clause identifying the kind of event in this noun group related to how Tomás felt and how he was becoming a storyteller. While this formulation is somewhat clumsy, it enables the writer, in the same sentence, to present and evaluate what she has chosen as a key event in Tomás's evolution as he becomes a story teller in another complex noun group: Tomás with Papa Grande under a tree. Here condensing infor-mation in two complex noun groups creates an opening statement that makes a claim and points to the event that will be developed to support that claim across the text. The sentence includes nouns modified with prepositional phrases and embedded clauses to present an abstract construct (the most important event) that is put into relationship with an event from the story, Tomás with Papa Grande under a tree.

The writer goes on to argue authoritatively about the story, presenting a thesis that she develops through analysis of Tomás's feelings during the events to support her claims about how the events relate to Tomás becoming a storyteller. By identifying the event *under the tree* as *important*, she also engages in an early form of the critique of literature that will be the focus of knowledge development in language arts over the school years. This compacting of information in dense long noun groups is the beginning of development of a facility with language that will continue to emerge through adolescence in discipline-specific ways; here, building the resources for writing thematic analyses of literature in the later years.

But expansion of the noun group has its limits, as the clumsy formulation of this student suggests. By early adolescence, the texts that children are asked to write increasingly require that they present their perspectives in more abstract generalizations. At this stage, writing about events that have an impact on a character's development may require sentences like this:

> Tomás's storytelling ability was shaped by participation in family contexts of storytelling, as well as through his encounters with literature.

Note the different character of the noun groups used here: *storytelling ability, engagement in family contexts of storytelling, encounters with literature.* What has developed here is not just vocabulary, but the ability to present events in abstractions, repackaging events (*he told the story well*) as things (presented in nouns) that can be put into relationship with each other (*his storytelling ability*). Analyzing this sentence shows the following transformations of experience into abstract notions:

Reported Experience	Abstraction
Tomás was able to tell stories	Tomás's storytelling *ability*
Tomás told stories with his family	*participation* in family contexts of storytelling
Tomás read a lot of stories from the library, too	*encounters* with literature

While the young writer develops by expanding the noun group, the older writer needs to turn experience into abstractions that can be put into relationship with each other. The adolescent who continues to write in a mode more associated with spoken language, chaining clauses together to present one event after another will not be evaluated as a writer as highly as the student who can express this idea in more abstract ways (Macken-Horarik, 2006). Consider, for example, the student who writes a sentence presenting the same ideas as in the sentence above, but using register features more typically associated with oral language:

> Tomás was able to tell good stories because he told stories with his family and he read a lot of stories from the library, too.

Writing in this way will no longer be sufficient to present the kind of analytic arguments required for success in school in adolescence. Having the capacity to express generalization and abstract ideas in written language calls for language development to support new ways of thinking and presenting knowledge, as abstractions enable evaluation to be infused into a clause and for texts to be structured to develop an argument as the writer moves from clause to clause.

5 Grammatical metaphor: development over time in the child and the subject area

We saw above, in the example from Lacie in social studies and history, that nouns are important linguistic resources for constructing an authoritative *tenor* and presenting information in the written *mode*. Relatively long and abstract noun groups in her argument (*Another reason Jacob Zuma should not be endorsed* (with a clause embedded in the noun group) and *the rate of employed people* (compare with, e.g., *many people were unemployed*) show that Lacie is growing in her capacity to present abstract knowledge in social studies.

One role of abstractions is to create relationships and categories within a text that organize the points to be made. Flowerdew (2003) refers to nouns that do such work as *signaling nouns;* abstract nouns that point to what has come before or what will be presented later (e.g., Lacie's "Another *reason…*").

This 11th grade writer, age 16, also uses signaling nouns (underlined here) in his opening paragraph of an analysis of the successes of the U.S. Civil Rights movement:

> The Civil Rights Movement did lead to <u>successful change</u> in Post World War II America in which now society accepts other races, gives citizens the right to vote and allows other citizens an opportunity to learn and enjoy life to the fullest. These are <u>many factors</u> that are open to people today, some are still in question but not like it was during the 50's, 60's, and beginning of the 70's. Many of <u>the contributions that led this change</u> were <u>specific tactics</u>, <u>strategies</u> and <u>great leaders</u> who set forth to change the public opinion of what now we live in society. (D9)

Using the abstraction *successful change* enables the author to list three changes that have occurred, and then use the abstraction *many factors* to refer back to that list of *changes* in the U.S. since WW II. In the following sentence, he sets up a taxonomy of *contributions that led this change,* a superordinate term whose members are the *tactics, strategies,* and *great leaders.* Being able to draw on signaling nouns enables the author to set up a claim and support it, naming the elements of the argument to be developed.

The ability to condense language into more abstract meanings calls for a linguistic technology that Halliday (e.g., 1998) has called *grammatical metaphor.* The concept of grammatical metaphor helps us understand how language develops along with knowledge as children mature and work across different subject areas.

In early writing, as we saw, children draw on language in ways that reflect how they speak. They represent their lived experience in *congruent expression*. This means (using Halliday's grammatical metalanguage) that nouns present *participants* (people and things), verbs present *processes* (e.g., of *doing, thinking, being*), and conjunctions present *logical relationships between clauses*.

Papa Grande *told* **a stor**y <u>and</u> **Tomás** *liked* **it**.
Participants *Processes* <u>Conjunctions</u>

In the presentation of knowledge in school subjects, as students move through the years and subject areas, they increasingly encounter and need to use language that is not congruent, what Halliday calls *non-congruent expression* or *grammatical metaphor*.

A lexical metaphor refers to an expression that has two meanings, the literal and the metaphoric:

Lexical metaphor: same wording, different meaning:
"It's not my cup of tea." (metaphoric meaning: *I don't prefer it; it's not my 'thing'*)

Grammatical metaphor, in contrast, refers to expressions that have the 'same' meaning expressed in different wording:

"People compared the statistics…" = "A statistical comparison"

Here an idea that has been expressed in a whole clause is repackaged as a noun group. Grammatical metaphor is not typical of speech in everyday contexts. It evolved in the context of scientific writing, and has since been adopted as a linguistic technology for knowledge construction across most fields of study, as well as in bureaucratic and institutional discourses (where it is less functional and instead often obfuscating). Halliday (1993b) described how this feature of the grammar of written language evolved over centuries, first in science, as the grammatical choices scientists made in their writing enabled new ways of taxonomizing and theorizing. He reports, for example, how Newton wrote in narrative and procedural ways about the experiments he did ("I held the prism…observed the length of its refracted image…it appears that…") (cited p. 58, Halliday, 1993b).

Today's science writers are expected to draw on very different grammatical structures in reporting on experiments, as the 'voice' through which science presents knowledge has evolved over time into the impersonal stance typical of science writing today. In 'everyday' language, for example, we might say:

People are destroying the rain forests.

But we would not typically encounter that formulation in a scientific presentation about this issue, where instead we would more likely encounter *the destruction of the rain forests* as the way this issue is presented. What is accomplished through this grammatical metaphor that takes a process, *destroying,* and presents it as a thing, *destruction*?

The word *destruction* is an abstraction, and by using it, the agents of destruction are elided (the *people* disappear). This can be functional for the writer, as presenting a generic *people* as the cause of deforestation (another abstraction) may not be exactly accurate for the point the scientist is making.

In addition, there is a text-forming function of nominalization that is very important for building theory, as the new 'entity' created through the nominalization *destruction* can serve as the point of departure for a sentence that draws implications about the destruction:

> People are destroying the rain forests. The destruction of the rain forests accelerates global climate change.

Distilling the idea that rainforests are being destroyed into a nominalization, through the process of grammatical metaphor, enables the author to express the significance of this 'destroying' in the same sentence, creating a flow of information by taking something that has been presented in a congruent way and distilling it into a nominalization that serves as the point of departure for the next clause.

The discourse patterns created through grammatical metaphor enable the introduction of concepts that then are nominalized and further developed. Compare the formulation above with the ways this idea would have to be expressed without the resource of grammatical metaphor:

> People are destroying rain forests and because they are destroying rain forests, the global climate is changing faster.

Grammatical metaphor enables more than distillation of meaning for text-structuring to present and develop theory; it also enables more authoritative presentation of the results of a science experiment. Compare these examples from 19 year-old engineering students. At issue here is the degree of confidence a student presents about the results of an experiment:

1. There were a lot of assumptions associated with this experiment which could have caused the discrepancy in the final result. It was assumed that the temperature at the interface was the temperature of the liquid and this may not be the case.
2. A great degree of uncertainty is attached to these results. Perhaps the discrepancies in the final results were due to unexpected variations in temperature at the interface or in the air mixture.

While the field-related meanings here are similar, the tenor is quite different, and the instructor evaluated the second student's writing as more effective (Schleppegrell, 2004b). Key to this is the way the writers express uncertainty. In discussing results and

commenting on the extent to which the results can be trusted, the first writer uses modal verbs (*could, may*) to suggest alternative possibilities operating in the experiment which might have affected the particular results. This presents these conclusions with tentativeness, as conditions that the writer was not certain about. The second writer, assisted by grammatical metaphor, draws on nominalizations (*uncertainty;* not *it may have been*), that enable a more authoritative, while still measured (*perhaps*) assertion.

Summary

Language and knowledge develop together, and control of the noun group is an important aspect of language development that supports knowledge development. In part this calls for the expansion of lexical resources (vocabulary), as in the example with signaling nouns; and the elaboration of noun groups more generally, as in the examples from language arts. Most powerful, however, in all subjects, is control over grammatical metaphor as a resource for knowledge distillation, text structuring, and authoritative presentation. Writers first learn to distill experience into complex noun groups that present abstractions, and then use grammatical metaphor to nominalize whole clauses in ways that enable the development and presentation of theory, putting abstractions into relationship with each other (Schleppegrell & Christie, 2018). Grammatical metaphor also enables attitudes and perspectives to be presented in impersonal and authoritative ways.

Let's return to Lacie's language in her year 7 social studies class, and consider how she is moving toward abstraction and grammatical metaphor, recognizing the challenges she faces and how she works with them.

First, her contribution to the class discussion:

> "So I underlined *the average*, *on average the economy has grown at 3.2% a year from 1994 to 2012* [reading from the text]. That's like only around like 19 years, and to me it seems like that's not a lot, like a lot of growth. I feel like, just like to me, that doesn't really feel like a lot of growth, like enough has changed.

Now, in her writing:

> Another reason Jacob Zuma should not be endorsed is because he lies about the rate of employed people. In his speech it says "…60% more people are employed now than in 1994." But in source #3, it says, "…official unemployment is about 25% and the real figure nearer 40%."

Lacie's spoken language quotes from the text she has read, where the author says *on average the economy has grown at 3.2%.* Lacie recasts this event into the nominalized grammatical metaphor *growth,* saying *that's not a lot of growth.* Here we see her, even in her spoken language, repackaging the notion of the economy *growing* into the nominalized *growth.* In her writing, on the other hand, she doesn't use nominalization herself, but she does quote a source that packages the language she has used, *the rate of em-*

ployed people, as *official unemployment.* Here her complex noun group, *the rate of employed people,* may be a somewhat infelicitous representation of *unemployment,* but we see her recasting the technical term into language that serves her purpose and presents the meaning she intends.

These examples show the flexibility with which students need to manage the linguistic technology involved in expressing ideas in different ways. They need to learn to use the resources of nouns, complex noun groups, and nominalization through grammatical metaphor to speak and write with authority, to read and develop knowledge from texts, and to engage in disciplinary discourses and practices.

6 Pedagogical implications

Literacy is more than decoding from symbols to words; it involves learning new forms of expression and new social practices as children respond to the demands of different subject areas (Christie, 2012; Schleppegrell & Christie, 2018). If we understand literacy to include disciplinary and social practices, then literacy learning is an aspect of language and knowledge development that varies as students encounter different presentations of knowledge and disciplinary practices as they encounter and enact the discourses of classroom learning in different subject areas.

I have described here how development of one language resource, expansion and elaboration of the noun group, enables the development and presentation of concepts, the calibration of attitude, evaluation, and commitment, and the structuring of information to enable the construction of theories and development of arguments in a variety of ways (see also Fang, Schleppegrell, & Cox, 2006). I have illustrated how this language resource makes functional contributions to knowledge presentation in history/social studies, language arts, and science. These linguistic patterns can be made a focus of attention in teaching and learning to promote students' language awareness and raise their consciousness about language and meaning as they learn across subject areas. They can also be made a focus of teachers' attention to enable them to recognize how knowledge is presented in the texts students encounter in different disciplines.

For example, too many children read without recognizing stretches of words as constituting meaningful phrases or clauses. With teacher support, even young learners can "unpack" nominalizations and long noun groups to explore their meaning. As children mature, they can be encouraged to expand noun groups and use nominalization for the functional purposes relevant to different disciplinary goals. Comparing less nominalized with more nominalized ways of presenting knowledge helps learners see how in different contexts, the register features of the language they use can vary in ways that are valued.

Knowledge is shaped by disciplinary epistemologies and purposes, and is realized in great part through language. The registers that are valued as students present knowledge can be shaped by teachers who help students learn to see language choices as functional for achieving different purposes. Teachers who recognize and can draw

learners' attention to these purposes can better support students' knowledge development. In this sense, learning school subjects is to a great extent learning to use language in new ways. As Halliday has put it, language enables 'experience' to become 'knowledge' (Halliday, 1993a). The better teachers understand the forms language takes in presenting knowledge, and how those forms vary by context of language use, the better teachers can support children's learning.

Language awareness is often a neglected area of pedagogy. As the examples presented here demonstrate, language awareness is important not only in language arts, but also in history/social studies, science, and other school subjects. Teachers who recognize the challenges of language development for learning school subjects can build developmental pathways with a focus on language into the curriculum that is offered and be prepared to support students in developing control of the language resources needed for achieving disciplinary goals.

One of those resources is expansion of the noun group and development of grammatical metaphor through nominalization as a resource for constructing knowledge. The density of information in texts increases across the school years as information is distilled in elaborate noun groups, with extension and elaboration of meanings in prepositional phrases and embedded clauses that build information and enable the interpretation of texts and events. This is true of both the texts students read and the texts they are expected to write. As successful children develop literacy, control over the resources of noun groups and nominalizations enables them to increase their capacity to express generalization and abstract ideas in written language. With greater support for a focus on language in learning all subjects, more children can develop both knowledge and the ability to present it effectively across the school years and varied disciplinary contexts. This is especially important where children may be learning in a language that is not their home language.

7 Conclusions

The knowledge and practices of different fields of study shape the ways attitude and evaluation need to be presented (for example, offering evaluation, judgment, and interpretation in the humanities and expressing likelihood, assessing significance, and acknowledging limitations in scientific fields), and students need support to engage with and create texts that enact the discursive practices of different fields of study. Each discipline has its particular interpretive practices, ways of recognizing different points of view, approaches to expressing degrees of commitment to what is said or written, and different norms for expression of attitude. These are patterns of discourse and language use that novices need to engage with and learn to use. Learning to navigate these different ways of making-meaning is a challenging enterprise.

In addition to the meanings presented in grammatical features such as noun groups, the different social purposes of the disciplines are also achieved through their typical genres: explanation in science, argument in history/social science, and literary analysis in language arts. Each of these draws on particular representative patterns of language. This is true for every language through which schooling is available, as every language

offers resources that have evolved in particular ways to enable the effective and authoritative presentation of knowledge in different fields of study. Students can be made aware of the language choices that enable them to effectively engage in learning in subject-relevant ways.

A focus on language and how it presents the knowledge of different disciplines in distinctive ways offers us new ways of thinking about how we can support the diversity of learners in today's classrooms across the world in successful engagement in discursive practices across school subjects. With better understanding of the relationship between knowledge and language, teachers can make language a focus of instruction in service of knowledge development in different disciplines. This can enable them to provide pathways into learning that help children develop control of the language resources needed for achieving disciplinary goals.

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Mary J. Schleppegrell

is Professor of Education at the University of Michigan, Ann Arbor, where her research explores the relationship between language and learning with a focus on students for whom English is a second language.